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VAN DYKE, GARDNER, LINN AND BURKHART, LLP 2851 CHARLEVOIX DRIVE, S.E. P.O. BOX 888695 GRAND RAPIDS, MI 49588-8695			HASSANZADEH, PARVIZ	
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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 2004

Application Number: 09/710,769  
Filing Date: November 09, 2000  
Appellant(s): GEBELE ET AL.

Frederick S. Burkhart  
For Appellant

**EXAMINER'S ANSWER**

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This is in response to the appeal brief filed 4/20/04.

A statement identifying the real party in interest is contained in the brief.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

This appeal involves claims 1, 13, 14, 17, 25-27.

Claims 2-6, 11, 12, 15 and 16 are allowed. Rejection under 112/2<sup>nd</sup> paragraph are withdrawn in view of argument submitted on pages 5-6 of appeal brief filed 4/20/04.

Claims 20-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 7-10, 18, 19, 24 and 28-33 are withdrawn from consideration as not directed to the elected species and method.

**(4) *Status of Amendments After Final***

No amendment after final has been filed.

**(5) *Summary of Invention***

The summary of invention contained in the brief is substantially correct. The invention of claim 1 is an electrode arrangement for plasma-aided coating of a substrate with a layer, comprising:

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an anode arrangement defining a first material component at an anode material surface for evaporation;

a cathode arrangement defining a second material component at a cathode material surface, the cathode material surface having an evaporation-active part supporting a plasma discharge and an evaporation-inactive part not supporting the plasma discharge;

a gas supply for supplying protective gas in front of the cathode material surface to the evaporation-active part of the cathode material surface; and

a baffle arrangement exposing the evaporation-active part at a baffle opening for the plasma discharge and shading of the evaporation-inactive part correspondingly from the plasma discharge;

wherein the protective gas is so introduced into an intermediate space between the baffle arrangement and the cathode material surface that the supplied protective gas escapes at least partially through the baffle opening towards the plasma discharge from the intermediate space between the cathode material surface and the baffle arrangement.

Claims 13 and 14 are considered redundant as the limitation of these claims are included in the claim 1.

Claim 17 recites the plasma discharge is an arc discharge.

Claims 25-27 further recite the anode arrangement includes heatable crucible, the first material component comprising silicon, and the second material components comprising on of copper, zinc, brass and magnesium, respectively.

**(6) Issues**

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The appellant's statement of the issues in the brief is substantially correct. The changes are as follows:

1. Whether claims 1, 13, 14 and 17 are unpatentable under 35 U.S.C. § 102(b) as being anticipated by Japanese Patent publication No. JP 1 1-10066 1 A to Akamatsu et al.

2. Whether claims 25-27 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Japanese Patent Publication No. 1 1-100661 A to Akamatsu et al in view of International Patent Publication No. WO 00/46418 by Heinrich et al.

**(7) *Grouping of Claims***

The rejection of claims 1, 13, 14, 17, 25-27 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

**(8) *Claims Appealed***

A substantially correct copy of appealed claims 1, 13, 14, 17, 25-27 appears on pages 1-3 of the Appendix to the appellant's brief. The errors are as follows: claims 2-6, 11, 12-15, 16 are allowed and claims 20-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**(9) *Prior Art of Record***

JP 11-100661-A	Akamatsu et al	4/1999
WO 00/46418	Klaus et al	8/2000

**(10) *Grounds of Rejection***

The following ground(s) of rejection are applicable to the appealed claims:

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**Claims 1, 13, 14 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Akamatsu et al (JP 11-100661 A).**

Akamatsu et al teach a *plasma coating apparatus* (Fig. 1) for plasma-aided coating of a substrate 10 with a layer, the apparatus comprising:

an anode part 3 including a vapor deposition material 6 (*an anode arrangement which defines a first material component at an anode material surface for evaporation*); and

a cathode section or enclosure 2 (*baffle arrangement*) coupled to a reaction chamber 1 through an opening, the cathode section 2 includes a cathode 5 (*a cathode arrangement which defines a second material component at a cathode material surface*) disposed inside the cathode section 2 wherein as shown in Fig. 1 a front surface of cathode 5 is exposed to a plasma 4 (*wherein the cathode material surface is constituted by an evaporation-active part supporting the plasma discharge*) formed between the anode 3 and the cathode 5 and extending through the opening of the cathode part 2;

a gas introducing tube 13 supplying a gas at the front surface of the cathode 5 (*a gas supply for supplying protective gas in front of the cathode material surface to the evaporation-active part of the cathode material surface*) wherein the gas flows from the cathode front surface towards the chamber 1 through the opening of the enclosure 2, wherein the flow of the gas extending from the cathode towards the anode would inherently protect the surface of the cathode being contaminated by anode material present in the discharge; and

wherein other sides of the cathode 5, that is, the back, bottom, upper, left, and right sides of the cathode 5, which are enclosed in the cathode section 2, are not exposed to plasma 4 which is formed between the anode 3 and the cathode 5 and extending through the opening of the

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cathode part 2 (*an evaporation-inactive part not supporting the plasma discharge*) (Abstract and paragraph 0018-0024).

*Regarding claims 13, 14:* as recited above the apparatus includes a gas introducing tube 13 supplying a gas at the front surface (evaporation-active surface) of the cathode 5.

*Regarding claim 17:* The plasma 4 is an arc discharge plasma produced between the anode 2 and the cathode 5.

**Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akamatsu et al (JP 11-100661 A) in view of Klaus et al (WO 00/46418).**

Akamatsu et al teach all limitations of the claims as discussed above except for the anode arrangement including a heatable crucible; the first material component comprising silicon; and the second material component comprising one of copper, zinc, brass and magnesium.

Klaus et al teach a device for coating a substrate with a coating material, the device including a cathode 29 and an anode crucible 5, wherein the anode crucible 5 is provided with a heater 7 for heating the crucible 5 (abstract and Fig. 1).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the heater as taught by Klaus et al in the apparatus of Akamatsu et al in order to heat the anode so that the amount of the anode material vaporized into the discharge is further controlled.

*Regarding claims 26, 27:* The particular type of material used is a process limitation rather than an apparatus limitation, and the recitation of a particular type of material does not limit an apparatus claim, see *In re Casey*, 152 USPQ 235; *In re Rishoi*, 94 USPQ 71; *In re Young*, 25 USPQ 69; *In re Dulberg*, 129 USPQ 348; *Ex parte Thibault*, 64 USPQ 666; and *Ex*

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*parte Masham*, 2 USPQ2d 1647. This rejection is based on the fact the apparatus structure taught by Akamatsu et al has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on the inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

**(11) Response to Argument**

*1. Regarding anticipation rejection of claims 1, 13, 14 and 17:*

*A. Regarding "a gas supply for supplying protective gas in front of the cathode material surface to the evaporation-active part of the cathode material surface, wherein the protective gas is so introduced into an intermediate space between the baffle arrangement and the cathode material surface that the supplied gas escapes at least partially through the baffle opening towards the plasma discharge from the intermediate space between the cathode material surface and the baffle arrangement":*

Appellant argues Akamatsu et al do not disclose that the protective gas is introduced into an intermediate space between the baffle arrangement and the cathode material surface because it is not possible to supply a protective gas onto the evaporation-active surface of the cathode material 5 of Akamatsu et al from a gas introducing tube 13 provided in front of the cathode 5.

The Examiner asserts that the gas introducing tube 13, as shown in Fig. 1 of Akamatsu et al, introduces gas in front of the evaporation-active surface of the cathode 5. The gas flows from the cathode 5 towards anode 3 through an opening in the cathode apart or enclosure 2 (baffle arrangement). In another word, the introduced gas flows from the surface of the cathode 5 traveling through an intermediate space between the cathode 5 and the opening in the cathode enclosure 2 into the chamber 1 and towards the anode 3. The flow of the gas from the cathode 5



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towards the anode 3 would inherently prevent the anode material produced in the discharge reaching the cathode surface 5 and the flow of the gas would protect the surface of the cathode 5 from being contaminated by the anode material.

*B. Regarding the gas being a protective gas:*

The appellant argues that Akamatsu et al do not disclose the pipe 13 introduces a protective gas.

The Examiner assert that the flow of the gas from the cathode 5 towards the anode 3 would inherently protect the surface of the cathode 5 from being contaminated by the anode material. Furthermore, the particular type of gas used is a process limitation rather than an apparatus limitation, and the recitation of a particular type of gas does not limit an apparatus claim, see *In re Casey*, 152 USPQ 235; *In re Rishoi*, 94 USPQ 71; *In re Young*, 25 USPQ 69; *In re Dulberg*, 129 USPQ 348; *Ex parte Thibault*, 64 USPQ 666; and *Ex parte Masham*, 2 USPQ2d 1647. This rejection is based on the fact the apparatus structure taught by Akamatsu et al has the inherent capability of being used in the manner intended by the claims of the appellant. When a rejection is based on the inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112)

*C. Regarding the cathode material surface being constituted by an evaporation-active part supporting the plasma and an evaporation-inactive part not supporting the plasma, and a baffle arrangement exposing the evaporation-active part at a baffle opening for the plasma discharge and shading of the evaporation-inactive part correspondingly from the plasma discharge:*

The appellant argues that since the cathode section 5 is illustrated schematically, Akamatsu et al do not disclose the cathode material as recited in the claim.

The Examiner asserts that Akamatsu et al disclose a cathode material 5 enclosed in cathode section or enclosure 2 having an opening into the chamber 1 as disclosed in paragraphs 0018-0024 and as shown in Fig. 1. The front surface of the cathode 5 facing the opening of the enclosure is exposed to plasma 4 and corresponds to the evaporation-active surface and the remaining unexposed surface of the cathode 5 including the back and the sides of the cathode corresponds to the evaporation-inactive material. The cathode section or enclosure 2 including the opening extending into the chamber 1 correspond to the baffle arrangement and the baffle opening as recited in claim 1.

2. *Regarding obviousness rejection of claim 25-27:*

Appellant argues that since Akamatsu et al do not anticipate claim 1, claims 25-27 which are dependent on claim 1 as a base claim are allowable.

The Examiner asserts that claim 1 stands rejected as being anticipated by Akamatsu et al as discussed above and claim 25-27 are rejected as being unpatentable over Akamatsu et al in view of Klaus et al. Klaus et al has been relied upon for teaching the additional limitations recited in claim 25-27. Claim 25-27 stand rejected as the base claim 1 stands rejected and the additional limitations recited in claims 25-27 are rendered obvious in view of Klaus as discussed above.

In brief, the prior art by Akamatsu et al discloses an electrode arrangement for plasma-assisted coating of a substrate with a coating layer, the electrode arrangement comprises a cathode 5 enclosed within a cathode section 2 (baffle) having an opening extending into a

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chamber 1 wherein a gas tube 13 provides a gas flowing from a front surface of the cathode facing the opening (exposed surface) towards an anode 3 in the chamber 1, wherein the gas flows from the front surface of the cathode 5 through the opening into the chamber 1 and towards the anode as a plasma discharge is produced between the cathode and the anode. The flow of the gas from the exposed surface of the cathode into the chamber 1 would inherently prevent the anode material produced in the discharge reaching the cathode, that is, the flow of the gas would inherently protect the surface of the cathode.

To restate, claims 1, 13, 14 and 17 are anticipated by Akamatsu et al since the coating device of Akamatsu et al teaches all limitations of the claims including a cathode material protected from the anode material in the discharge produced between the cathode and the anode by providing a baffle arrangement (cathode section 2) having an opening and a gas supply tube 13 introducing a gas flowing a front surface of the cathode through the opening towards the anode and thus preventing the surface of the cathode being contaminated from the anode material in the discharge.

For the above reasons, it is believed that the rejections should be sustained.

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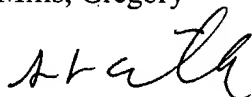
Respectfully submitted,

*P. Hassanzadeh*  
Parviz Hassanzadeh  
Primary Examiner  
Art Unit 1763

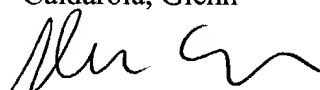
May 18, 2004

Conferees:

Mills, Gregory



Caldarola, Glenn



VAN DYKE, GARDNER, LINN AND BURKHART, LLP  
2851 CHARLEVOIX DRIVE, S.E.  
P.O. BOX 888695  
GRAND RAPIDS, MI 49588-8695